BRIEF NOTE ON

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQIP)

▪ **BACKGROUND :**

Indian system of Engineering education has become vast and so far a total number of 3393 engineering degree institutions have been established with intake capacity of 14,85,894 seats as in 2011-12. However, this expansion has not resulted in significant growth of quality graduates due to paucity of experienced, motivated and competent faculty.

The quality of education and training being imparted in the engineering education institutions varies from excellent to poor, with some institutions comparing favourably with the best in the world and others suffering from different degrees of handicaps. There is a wide gap between the educational standards of premier institutes like IITs and other engineering institutions. The IITs have to act as a catalyst in the growth of quality Technical Education in the country, and play a major role in training faculty from the other institutions of the country in both teaching and research.

Some of the concerns in the present engineering education system are as below,

- Acute Faculty Shortage
- Poor Industry-academia collaboration
- Obsolete learning infrastructure
- Stagnating research
- Attracting Students to become faculty
- Disproportionate outputs at UG &PG levels

During 1980s, Government of India (GoI) and the State Governments have felt the need for revamping the Technician Education System in the country to make it demand-driven with relevant courses in new and emerging technologies, with adequate infrastructure resources, competent faculty and effective teaching-learning processes. The Government of India supported 25 State Governments and 2 Union Territories of Andaman & Nicobar and Puducherry through three Technician Education Projects during 1991-2007, with assistance from the World Bank, which helped to strengthen and upgrade the system and benefited 552 polytechnics.

The success of these projects encouraged the Government of India and the State Governments to seek more funding from the World Bank for systemic transformation of the Technical Education System with focus on Degree level Engineering Education. In 2002-03, the Government of India with the financial assistance from the World Bank launched a Technical Education Quality Improvement Programme (TEQIP) as a long-term Programme of 10-12 years, to be implemented in three phases for systemic transformation of the Technical Education System.

- **TEQIP (Phase-I) :**

The first phase of TEQIP commenced in March 2003 and ended in March 2009, covering 127 institutions in 13 States. This project covered less than 10% of the institutions. TEQIP helped the Institutions with incentives and funding. Through competitive funding, each participating institutions implemented a set of reforms that promoted academic and administrative autonomy. The bottom-up approach empowered the institutions to improve curriculum, teaching, and assessment, according to the demand for skills and newest research. Autonomy and accountability reforms took place through the creation of a Board of Governors; nearly all participating institutions took the first step towards autonomous governance and increased accountability. Further, TEQIP invested in faculty development, encouraged participation in national and international conferences, and it financed necessary purchase of modern labs and research instruments. The facilitation and monitoring of Directors, State and Central Government and the World Bank, was also critical to acknowledge and reward the efforts of faculty undertaking research.

o **Notable results :**

Institutions and faculty participating in the first phase of the project produced notable results in terms of increased: placement of graduates, research, PG students, and academic autonomy as described below:

S.No.	Particulars	Start (2002)	End(2009)
1	UG Placement rate	41%	76%
2	UG start salary (annually)	1.7 lakh	2.8 lakh
3	Research papers published	453	4,273
4	PG graduates	7,218 MTech 342 PhDs	10,571 MTechs 587 PhDs
5	Share of programs accredited	40% est.*	93%

* est.: estimated. Accreditation includes programs applied for accreditation

- **TEQIP (PHASE-II) :**

Building upon the satisfactory completion of the first phase of TEQIP, its second phase (TEQIP-II) has now initiated in which around 200 engineering institutions are planned to be competitively selected to improve quality of Technical Education through institutional and systemic reforms. It follows the same principles as the first phase, while beefing up implementation with rigorous and detailed monitoring and computerized procedures. Further, capacity-building of government officials, governing bodies, directors, and faculty have been scaled up. Lastly, the second phase boosts efforts to prepare more post-graduate students to reduce the shortage of qualified faculty, and to produce more R&D in collaboration with industry. The project has yielded important early results in terms of increased academic autonomy and participation of more lagging states.

- **PROJECT OBJECTIVES :**

The Project will focus on the following objectives:

  o Strengthening Institutions to produce high quality engineers for better employability,

  o Scaling-up postgraduate education and demand-driven Research & Development and Innovation,

  o Establishing Centers of Excellence for focused applicable research,

  o Training of faculty for effective Teaching, and

  o Enhancing Institutional and System Management effectiveness.

- **PROJECT STRATEGY :**
  o The Project will be implemented in pursuance of the National Policy on Education (NPE-1986 revised in 1992) through the Ministry of Human Resource Development (MHRD) of the Government of India as a "Centrally Sponsored Scheme" (CSS) with matching contribution from the State Governments and Union Territories. Project cost in the Govt. and Govt. aided institutions for all sub-components will be shared between the MHRD and State Governments in the ratio of 75:25 by all States except the Special Category States for which the ratio will be 90:10. For Centrally Funded Institutions, 100% of institutional project costs will be borne by the MHRD.

  o Funding for private unaided institutions in all States selected under Sub-component 1.1 for improving competencies of UG students, will be in the ratio of 60:20:20 i.e. 60% funding as Grant from MHRD, 20% funding as Grant from State and 20% funding from institutions.

  o A set of Eligibility Criteria for States will be enforced to achieve a high and sustained impact of the Project. The criteria will seek to give the project institutions adequate decision making powers that will enable and encourage them to deliver quality education and undertake research in an efficient manner. A primary focus is to transform the Governments' traditional role of input-control towards a role of focusing on outcomes, and incentivizing improvements in Engineering Education.

  o The Project will require the project institutions to implement academic and non-academic reforms for their self-conceived development programmes that focus on quality and relevance, excellence, resource mobilization, greater institutional autonomy with accountability, research and equity.

  o The Project will provide specific funds for imparting Pedagogical Training to faculty for making teaching effective and will cover maximum faculty members from the project institutions. The benefit of this aspect of the Project will also be extended to faculty from non-project institutions.

  o Professional development programmes for engineering-education policy planners, administrators and implementers at the Central, State and Institutional levels will be organized. The Project will also support development of an effective governance model.

  o The Project will lay major emphasis on monitoring and evaluation. The prime responsibility of monitoring will lie with the institutions themselves. The management structure at the Institutional level i.e. the Board of Governors (BoG) will monitor the progress of Institutional projects on a regular basis and provide guidance for improving the performance of institutions in project implementation. The information from project institutions will be collected through a scalable web-based Management Information System (MIS). State Governments will also regularly monitor and evaluate the progress of institutions. The Government of India and the World Bank will conduct bi-annual Joint Reviews of the Project with assistance from the National Project Implementation Unit (NPIU). The monitoring will be based on action plans prepared by each project institution and achievements made on a set of Key Performance Indicators (KPIs) which will be defined in the Institutional Development Proposals. The monitoring will focus on implementation of reforms by institutions, achievements in project activities under different Sub-components, procurement of resources and services, utilization of financial allocations and achievements in faculty and staff development and management development activities.

  o The Project proposes to maximize collaboration between local Industries and project institutions by providing the National Steering Committee and State Steering Committees (through National and State level Private Sector Advisory Groups) with timely, precise and concrete advice and summarized feedback on Industry-Institution partnerships to meet the national demand for Graduates and Postgraduates equipped with skills and knowledge relevant to the changing market requirements.

  o Establishing Centres of Excellence with potential of world-class research in emerging areas is one of the important aspects of the Project.

- **PROJECT DESIGN:**

The Project is composed of following Components and Sub-components:

Component - 1 : Improving Quality of Education in Selected Institutions

This Component aims to strengthen around 200 competitively selected Engineering Education Institutions to improve learning outcomes and employability and scale-up Postgraduate education, research & development and innovation and establishing Centres of Excellence. The faculty of these institutions will also be offered pedagogical training for effective teaching through the following sub-components:

> *Sub-Component 1.1*   :   Strengthening institutions to improve learning outcomes and employability of graduates

> *Sub-Component 1.2*   :   Scaling-up Postgraduate Education and Demand-Driven Research & Development and Innovation

> *Sub-Component 1.2.1*   :   Establishing Centres of Excellence

> *Sub-Component 1.3*   :   Faculty Development for Effective Teaching (Pedagogical Training)

Component - 2 : Improving System Management:

This Component aims to build capacity of Technical Education Policy Planners, Administrators and Implementers at the Central, State, and Institutional levels to effectively implement the institutional reforms and to introduce and sustain innovative systemic quality improvement practices.

It also aims to provide timely, sufficient, precise, and reliable information to improve and assess the performance of the selected institutions through effective Project Management through the following sub-components:

> *Sub-Component 2.1*   :   Capacity Building to Strengthen Management

> *Sub-Component 2.2*   :   Project Management, Monitoring and Evaluation

- **PROJECT OUTLAY :**

  o Total outlay of the Project   :   Rs. 2430.00 crore
  o Central Contribution   :   Rs. 1881.00crore
      (a) World Bank Share(Rs.1395.50crore)
      (b) MHRD Share (Rs.485.50crore)
  o States Contribution   :   Rs. 529.00crore
  o Private unaided institutions contribution   :   Rs. 20.00 crore

  o Approximately Rs. 10.00 crore per Centrally funded, Government Funded, Government Aided and Rs.4.00 crore per Private unaided Institution will be allocated under Sub-component 1.1.
  o Approximately Rs. 12.50 crore per Centrally funded, Government Funded, Government Aided and Rs.4.00 crore per Private unaided Institution will be allocated under Sub-component 1.2.
  o Additional Rs. 5.00 crore per CoE will be allocated under sub component 1.2.1.

PLANNED PROJECT ACTIVITIES :

Part A : Improving Quality of Education in Participating Institutions

1. Strengthening Participating Institutions with a view to improving learning outcomes and employability of graduates, and scaling-up post-graduate education, demand-driven research and development and innovation, through:

    (a) faculty and staff development;

    (b) enhancing interaction with the industrial sectors;

    (c) improving institutional governance, and management and administrative practices that are conducive to academic autonomy;

    (d) implementing relevant institutional reforms;

    (e) improving teaching, training and learning facilities;

    (f) providing academic support to weak students;

    (g) increasing enrolment in post-graduate programmes, and enhancing research and consultancy activities;

    (h) modernizing libraries and other means to access knowledge resources;

    (i) enhancing research and development;

    (j) developing research interest among degree students;

    (k) sharing resources through collaborative arrangements;

    (l) modernizing and expanding laboratories; and

    (m) establishing inter-disciplinary centers of excellence that conduct applicable thematic research and development in collaboration with industry and other knowledge users, converting research results into applicable technologies and projects, and enhancing collaborative actives with national and international institutions.

2. Faculty development for effective teaching through the provision of pedagogical training to faculty.

Part B : Improving Education System Management

1. Strengthening the education sector's capacity through:

    (a) the establishment of quality assurance practices and the promotion of effective governance in Participating States;

    (b) the establishment of a task force responsible for strategic planning of technical education in Participating States;

    (c) the establishment of curriculum development cells and the enhancement of management practices in universities affiliated with Project institutions;

    (d) the sharing of best practices with non-Participating Institutions; and

    (e) the organizing of professional development programmes for policy planners and administrators.

2. Improving the education system's management, monitoring and evaluation capacity of Participating States and Participating Institutions through:

    (a) the establishment and operation of Project management units at the national and State levels;

    (b) the establishment of an education management information system;

    (c) the carrying out of stakeholder satisfaction surveys, performance and fiduciary audits, and impact assessment studies, and

    (d) the carrying out of implementation and impact reviews of Institutional Development Subprojects.

- **EXPECTED OUTCOME OF THE PROJECT:**

Expected outcomes	Expected Outputs	Indicators
Strengthened Institutions with improved learning outcomes and employability of Graduates	Autonomy for institutions	No. of institutions with autonomy
	Accredited programmes	No. of UG and PG programmes accredited
	Higher and quality placement for students	• Rate of campus placement of graduates • Annual salary package offers to graduates • Rate of high quality graduates (those having 75% or more aggregate score/grade)
	Enhancement of PG recruitment	No. of new PG programmes introduced
	Enhanced learning facilities	• No. of laboratories taken up for modernization and strengthening of laboratories • No. of classrooms modernized • No. of libraries strengthened and modernized with increased access to knowledge resources • No. of centralised and Departmental Computer facilities
	Pedagogical training to faculty	• Number of faculty trained. • Student's feed back on teacher competence improvement by Performance Audits
Scaled-up Post Graduate education and demand-driven Research & Development and Innovation	Enrolment of additional M Techs with teaching assistantships for non-Gate scholars Enrolment of additional PhDs with teaching assistantships for Gate scholars	• Number of new M Tech/PhD students and post doctoral fellows. • Number of externally funded R&D projects. • Revenue generated through consultancies. • Number of publications in refereed journals, citations and patents obtained/filed. • Number of collaborations with other institutions
Focused attention to weaker students	Finishing school in each institution	No. of placements of weaker students in reputed industries
Multi-disciplinary applicable research in specific thematic areas in close collaboration with industries.	Establishment of centers of excellence	• No. of exchange programmes of research students and faculty with foreign collaborating institutions. • No of Conferences/Seminars/Symposia and Workshops organized at National and International level. • No. of Publications in peer-reviewed journals. • No. of Patents obtained and filed. • Number of Industry Chairs secured. • No. of MOUs with industry and academia, both within India and abroad. • No. of Innovations commercialized.

▪ **SELECTION STATUS OF INSTITUTIONS:**

Sub-component 1.1: In first cycle of selection, a total of 85 institutions i.e. [6 Centrally Funded, 54 State Govt. funded and aided and 25 Private Unaided institutions] are selected for participation in the Project.

Sub-component 1.2: A total of 73 institutions i.e. [17 Centrally Funded, 42 State Govt. funded and aided and 14 Private unaided institutions] are selected for participation in the Project.

Thus a total of 158 Institutions (85+73) in both Sub-components are selected for participation in the project.

Advertisement has been published on 8th August 2012 for 2nd round of selection of around 40 Govt. / Govt. aided Institutions under Sub-component 1.1.

- **MONITORING & EVALUATION**

Monitoring and evaluation (M&E) provide information to stakeholders that lead to project improvements, funding decisions, accountability and learning.

The Project TEQIP-II will be monitored through:

  o   Key Performance Indicators (KPIs)
  o   Web based Management Information System (MIS)
  o   Web based Financial Monitoring Report (e-FMR)
  o   Web based Procurement management Support System (PMSS)

The project evaluation will be done through surveys, audits, studies and national level reviews.

Academic progress including KPI targets of the institutions will be reviewed in the Joint Review Mission proposed in October/November 2012 thorough MIS.

- **MONITORING :**

Key Performance Indicators with target values

S. No	Indicators	Target values	
		Sub-Component 1.1	**Sub-Component 1.2**
1	Share of Supported eligible programmes that are accredited plus applied for	50% (UG+PG) (*) 80% (UG+PG) (**)	75% UG & 60% PG (*) 85% UG & 70% PG (**)
2	Percentage of institutions with academic autonomy	100% (*)	Already autonomous
3	a) Increase in percentage of regular faculty with Masters degree in engineering disciplines above baseline	20% (*) & 40% (**)	----------
	b) Increase in Percentage of regular faculty with Doctoral degree in engineering disciplines above baseline	10% (*) & 20% (**)	20% (*) & 25% (**)
4	Faculty position filled+	(i) For Govt. funded & aided institutions : 70% (with at least 55% on regular appointment and remaining on 11 months or longer contracts) (*) 80% (with at least 60% on regular appointment and remaining on 11 months or longer contracts) (**) (ii)For Private unaided institutions : 100% (with at least 60% on regular appointment and remaining on 11 months or longer contracts) (*) 100% (with at least 70% on regular appointment and remaining on 11 months or longer contracts) (**)	(i) For Govt. funded & aided institutions : 80% (with at least 70% on regular appointment and remaining on 11 months or longer contracts) (*) 90% (with at least 75% on regular appointment and remaining on 11 months or longer contracts) (**) (ii) For Private unaided institutions : 100% (with at least 70% on regular appointment and remaining on 11 months or longer contracts) (*) 100% (with at least 75% on regular appointment and remaining on 11 months or longer contracts) (**)
5	Increase in the number of publications in the field of Engineering in refereed journals	500 (***)	1000 (+ 500 for 1.2.1) (***)
6	Transition rate for students from the First year to the Second year of undergraduate programmes	45% (1 year) The transition rate needs to be improved by each institution during each Project-year.	
7	No. of additional Masters and Doctoral students enrolled with TEQIP funds in the project institutions during the project period.	3350 (Masters) and 2000 (PhD) (***)	
8	IRG as % of total annual recurring expenditure	As per Institutional Development Proposal (IDP)	

* within 2 years of Project start
** to be achieved by Project closure
*** National target
+ as per the AICTE prescribed faculty student ratio (MHRD norms will apply for NITs & CFIs)